National Park Service
U.S. Department of the Interior
Yellowstone National Park

Finding of No Significant Impact
Invasive Vegetation Management Plan

Background

In compliance with NEPA, the National Park Service (NPS) prepared an Environmental Assessment (EA) to examine various alternatives and environmental impacts associated with the proposal to implement a parkwide plan in Yellowstone National Park (YNP) to address terrestrial invasive nonnative plants.

This plan was developed in order to help prevent the establishment and spread of terrestrial invasive plant species and to restore, as needed, native plant communities within YNP. This Invasive Vegetation Management Plan and Environmental Assessment (EA) provides a comprehensive approach toward invasive vegetation management to preserve, protect, and restore the diversity, ecological integrity, and processes associated with native plant communities in the park. The purpose of this Invasive Vegetation Management Plan/EA is to expand current invasive plant management efforts and implement a parkwide strategy to prevent the establishment, and control the spread, of terrestrial nonnative plant species. The plan would also provide a strategy to restore, as needed, native plant communities. The plan is needed because the park currently lacks an up-to-date, comprehensive plan to preserve, protect, and restore the biodiversity, ecological integrity, and processes associated with the park's native plant communities.

The plan has three fundamental objectives:

1. **Prevent** the entry and establishment of new invasive plants as well as further infestations of invasive plants already present in the park.
2. **Control** existing populations of invasive plants, either by eradicating them, reducing their size and density or containing their spread.
3. **Restore** native plant communities disrupted or replaced by nonnative plant populations.

Other objectives of the plan include:

- **Identify best management practices** that include an array of techniques to prevent further spread of existing invasive plants and introductions of new invasive plant species.
- **Identify mechanisms for cooperation among neighboring agencies and landowners** to prevent the spread of existing invasive plants and introductions of new invasive plant species.
- **Establish decision-making tools** to guide integrated vegetation management activities.
- **Establish restoration treatments** in disturbed areas and restoration measures that could be incorporated into future actions.
- **Ensure visitor and employee safety** during project implementation.

- **Improve visitor experience and appreciation** for native plant communities in the park through awareness of invasive plant species.

Selection of the Preferred Alternative

This EA examined two alternatives, including Alternative A (No Action Alternative) and Alternative B (Application of Integrated Weed Management Practices). The National Park Service has selected Alternative B as the preferred alternative (selected action) because it best meets the purpose and need for Yellowstone National Park Invasive Vegetation Management Plan.

Under Alternative B, Yellowstone National Park will use a comprehensive decision-making process toward an integrated weed management (IWM) approach to manage invasive terrestrial vegetation. An IWM program will coordinate knowledge of pest biology, the environment, and available technology to reduce damage, using environmentally sound, cost-effective strategies that pose the least possible risk to people, park resources and the environment. The overall goal of the IWM program will be to preserve the biological diversity of native flora through prevention, containment, and control of invasive plants. This integrated approach will conform to adaptive management principles through ongoing assessment of the program's effectiveness, using annual monitoring data and making modifications as necessary and as better techniques become available. The IWM approach will emphasize cooperative efforts throughout the GYA (Greater Yellowstone Area), and the park will continue to participate in control efforts that benefit both the park and surrounding land.

The IWM program will provide guidance in determining the ecological impacts of invasive plants and direction in implementing science-based processes for selecting and developing control methods. Invasive species described and classified by priority levels that are determined largely by each species' degree of impact and whether effective control methods are available to treat it. Impacts on native plant communities and ecological processes, and to specific resource values (i.e., wetlands, rare native plants, geothermal areas, etc. and their communities) will be considered.

IWM procedures will be used to determine the most effective strategies for identifying invasive plant populations and controlling them through an array of treatments including mechanical, chemical, biological and/or cultural methods. Restoration treatments of disturbed areas will be established along with conservation and restoration measures to be incorporated into future projects.

An IWM strategy will be a flexible and adaptive process. Assessment through monitoring will be ongoing as managers define objectives or benchmarks for achieving success. Modifications could involve changes in control methods, the type and amount of herbicide used, and the timing of its application. The results of these changes will be monitored and evaluated, and recommendations will be made where changes will improve invasive plant management outcomes.

The following are components of the IWM program under the preferred alternative.

Education and Prevention

Park managers will strengthen prevention programs through increased education and interpretation, implementation of weed-free hay and sand and gravel restrictions, better preventive practices in park operations. Prevention programs will be strengthened through increased participation of NPS employees, concessionaires, researchers and contractors; improved preventive practices in park operations; and strengthened detection surveys.

Collaboration

Collaboration with invasive vegetation managers and experts within and outside the NPS will be conducted on a regular basis to help NPS resource managers keep informed on the latest invasive vegetation management technologies available. Such collaboration will also be an opportunity for individuals to share and learn from their invasive vegetation management successes and challenges.

Survey and Treatment

An IWM approach will apply best management practices in selecting an invasive species and location of infestations to treat. Survey, containment and/or control of invasive plant species or groups of species would use an array of treatment methods including physical or mechanical control, herbicide treatments, cultural methods, and biological control agents. This approach would be multidisciplinary, using ecological considerations to manage invasive plant species.

An IWM approach to invasive plant surveys and treatment can be summarized in these steps:

Step 1: Survey and identify invasive plant species. Only plants defined as nonnative and invasive will be considered target species under this plan.

Step 2: Determine whether nonnative plant meets the invasive plant action threshold. An invasive plant is "a nonnative plant whose introduction does or is likely to cause economic or environmental harm or harm to human health. If a nonnative plant is documented in the park, its effects on the surrounding vegetation and ecosystem will be assessed.

Step 3: Identify management priorities for invasive plants. Invasive plants will be grouped in priority classes based on criteria that include the degree of threat, sensitivity of the habitat, and likelihood that actions taken will achieve success within a reasonable time and amount of effort.

Step 4: Identify management strategy and select treatment method. Existing invasive plant infestations will be managed for eradication, containment, or suppression, depending upon the species and the size of the infestation.

Step 5: Confirm compliance with laws and regulations and obtain required approvals for the proposed treatment. Park resource managers will ensure that the proposed treatment complies with all applicable laws, regulations and NPS policy. Use of pesticides will meet the label requirements and be in compliance with other requirements. Any release of a biological control agent will have to be approved by the national coordinators of the NPS Invasive Species Program and Integrated Pest Management Program.

Step 6: Implement the selected treatment. The selected treatment methods to reduce invasive species will be implemented by park staff, the Northern Rocky Mountains Exotic Plant Management Team, and/or permitted volunteers, park partners or cooperators (agencies, organizations and neighbors), and contractors.

Step 7: Monitor the treatment to assess its efficacy. Weed managers will emphasize the need for inventory and monitoring to quantify problems and evaluate program effectiveness in meeting resource management objectives.

Management Strategy and Treatment Methods: Management strategies will be based on the characteristics of the species, the extent of its presence in the park, and its response to available treatments. Although the overall goal is always eradication, goals may be containment or suppression of a specific plant population

Treatment methods will be systematically analyzed over time to determine which will work best in each case based on the management strategy for that species, growth stage, site, and patch size with minimal risk to native organisms, their habitats, and human safety. Efforts to eliminate or control invasive species will include mechanical, cultural, chemical, and, when appropriate, biological treatments. All herbicides and biological control agents used will be approved by IPM specialists from Yellowstone and other NPS staff. Chemical and biological control agents will undergo a rigorous internal evaluation and compliance process to determine their efficacy in treating target species and risks to native species.

Mechanical Treatments: Mechanical or manual control (pulling, grubbing, mowing, or cutting weeds) will be the first choice for small infestations of species whose biology makes this treatment method the most practical and effective method and in sensitive areas near wetlands, waterways and geothermal features.

Chemical Treatments: Chemical control will be employed based upon its effectiveness, effects on wildlife, soil, and water, and health risks for those applying it and the general public. Staff will adhere to product label guidelines that have been developed to ensure human safety and minimal environmental impact. Herbicides will be used to eradicate and contain aggressive, high-priority invasive plant species that do not respond well to mechanical control or cultural treatment. Herbicides will be applied by spot spraying individual plants using backpack sprayers or boom sprayers mounted to UTV (utility terrain vehicle) tanks. Aerial spraying will not be used in the park. Human health and safety issues would be of paramount consideration. Staff will adhere to product label guidelines that have been developed to ensure human safety and minimal environmental impacts. Park staff will employ safety practices developed through approved Job Safety Analysis and Green-Amber-Red safety analysis.

Cultural Treatments: Methods of cultural treatment will be employed and include revegetation, top soil conservation, fire, shading, and the use of competition from native plants. Cultural control methods will be useful for large restoration projects. Cultivating will be used to reduce the number of nonnative plant seeds in the soil before restoring native plant communities on disturbed or depleted areas so that the native plants can prevent or reduce weed infestation.

The use of fire for invasive plant control will be employed in certain circumstances where an invasive plant population and its seed source can be effectively burned off so that native seed or plants can be established. Burns will be considered for larger-scale restoration efforts such as the Gardiner Basin revegetation project or for control of invasive plant species conducive to the use of fire as an effective weed treatment strategy.

Biological Treatments: Biological control (bio-control) or the use of living organisms to limit the abundance of a target nonnative species will be a long-term management tool that, when used in conjunction with other methods, may contribute to weed infestation containment. While biocontrol can occasionally be accomplished with native pathogens or from nonnative agents migrating from adjacent lands, typically one or more insect or pathogen species from the indigenous range of the target nonnative species is released into the target population to reduce its numbers and vigor.

Biological control agents may not be capable of completely eradicating an invasive plant population because as the number of host plants declines, so does the population of biocontrol agents. However, biological control could be a useful tool in reducing the size or density of a wide-spread invasive plant infestation, making other treatments more effective. Biocontrol is best suited to large, dense, aggressive nonnative plant infestations where eradication is impractical. Before approving release of a biocontrol agent, the USDA Animal and Plant Health Inspection Service

(APHIS) requires extensive research and testing to make sure that it will not affect native plant species.

Under the preferred alternative, park managers will annually review the list of host-specific biological control agents approved for use in controlling invasive vegetation and the scientific literature to weigh the benefits and potential negative impacts of using such a method. To minimize the possibility of negative impacts on park resources from the use of biological control agents, such releases will occur if all the following conditions are met:

- Other treatment options have proven ineffective or demonstrate unacceptable potential impacts.
- The threat to the park of continued spread of the targeted invasive plants outweighs the risk of introducing a nonnative biocontrol species into the park.
- Peer-reviewed published literature demonstrates a quantifiable measure of agent success under field conditions on the targeted weed species in similar habitats resulting in the proliferation of native plant species.
- Host specificity has been demonstrated under field conditions to the targeted species in similar habitats.
- Research indicates that the introduced biological control will not harm other native organisms, including plant populations of species similar to it.
- YNP staff has consulted with federal, state, and local weed managers outside the park, especially land managers adjacent to potential release sites.
- Additional NEPA compliance for the use of biological controls will be conducted beyond this environmental assessment. The level of NEPA compliance necessary will be determined by the scope and potential impacts of the proposed use of biological control.

Recordkeeping and Monitoring

A comprehensive monitoring system will be developed under the preferred alternative to gain a more thorough assessment of nonnative plant populations, the efficacy of control measures, and the potential impacts on native vegetation communities. Early detection efforts will be directed at the Priority 1 or 2 species or species appearing on the Watch List. Selected infestations would be monitored to determine the response of weed species and populations that have been treated. Park staff will continue to maintain records of invasive plant surveys and control efforts. These records will be annually incorporated into a regional GYA weed distribution database supported by the GYCC (Greater Yellowstone Coordinating Committee).

Restoration

Under the preferred alternative, land restoration and revegetation will be a component of all construction or maintenance projects that cause measurable ground disturbance. For excavation projects, top soil will be conserved and placed at the surface to act as a native seed source in bolstering the recovery of a site when filling trenches or other human-caused ground disturbance.

Restoration of native communities will be established including reestablishment of native soil and vegetation on land altered by previous management practices. This will include the Gardiner Basin along the park's north boundary, where roughly 700 acres that had been planted with nonnative crested wheatgrass was acquired by the National Park Service in the 1930s. The area has since been invaded by other nonnative annual plants. The park will inventory disturbed sites in the park to assess

the degree of disturbance and implement a program of ecological restoration based on priority, and monitor the results and the need for follow-up treatments.

Mitigation Measures

The following mitigation measures will be implemented during invasive vegetation management activities under the preferred alternative as needed to minimize the degree and severity of adverse effects.

- The park will have a certified applicator on site during projects involving herbicides. State certification, including herbicide training and safety, will be renewed every three years, with annual training as required. All project participants will receive herbicide training from a certified project leader.
- Project participants will abide by the personal protective equipment (PPE) requirements and rules outlined on the product label. Rubber gloves, long-sleeved shirts, and eye protection may be required PPE for application of herbicides. Job hazard analyses for herbicide application will be reviewed with all project participants annually and when a new project begins.
- All instructions on the herbicide label will be strictly followed. Herbicide containers will be properly labeled. Application equipment and chemicals will be stored in appropriate storage facilities separate from food and personal items. Current labels and Material Safety Data Sheets (MSDS) will be maintained for all chemicals at every site where they are kept. The MSDS contains fire and explosive hazard data, environmental and disposal information, health hazard data, handling precautions, and first aid information. All participants will review the MSDS with the project leader and understand first aid instructions described on the MSDS and label.
- If the label instructions for the herbicide and application method recommend limiting exposure to humans and pets, the area will be closed during and after treatment for the recommended time. Treatments that pose no risk to humans may be done at any time.
- All herbicide mixing and loading of sprayer tanks would occur in designated staging areas where there will be no impacts on native plant communities. Herbicide sprayer calibration and training will be employed to minimize sprayer drift. Staff will follow established protocols, safety plans, and spill response plans. Use of UTVs, equipment, and materials will comply with applicable safety plans and guidelines.
- Treatments will occur when the least number of visitors would be impacted by the closure. Signage informing visitors about the impacts of invasive vegetation and the importance and need for the activities will be placed to help mitigate visitor experience impacts.
- In wetland and aquatic areas, use of herbicides to control invasive plants will be minimized and park staff would employ more manual invasive plant removal.
- In geothermal areas, access will be minimized for employee safety and resource protection. Park staff will employ more manual invasive plant removal than herbicide use and will not use mechanized equipment off-road.
- There will be annual training for park staff on native and nonnative plant identification and treatment strategies for target species.

- Monitoring of invasive plant control treatments will enable park staff to adjust treatment types to maximize control efforts with minimum impacts on native plant and animal species.
- Removal of nonnative vegetation that has high value as forage will occur in consultation with the park's wildlife management staff.
- Prior to major nonnative control treatments and vegetation restoration activities at historical sites, a cultural resource specialist will be notified to help identify potential impacts on archeological sites or cultural landscapes and identify measures to avoid and minimize impacts on cultural resources. Treatments in known areas of high archeological or historic sensitivity will not employ mechanized equipment off-road.
- Invasive plant control within park recommended wilderness will not use mechanized access or equipment unless it is supported by completion of a Minimum Requirement Analysis.
- Access for invasive vegetation treatments will not occur in park designated Bear Management Areas unless under consultation with the park's Bear Management Biologist.

Alternatives Considered

Two alternatives were evaluated in the EA including the No Action Alternative and one action alternative. Under Alternative A, No Action, the park would continue current vegetation management programs and practices to control invasive plant species in the park. This would include maintaining existing levels of prevention, survey, treatment; record keeping of invasive vegetation control; and restoration of native plants associated with disturbance activities.

Under Alternative B, the preferred alternative (selected action), the park proposes to formalize current management practices described in Alternative A and enhance practices using an Integrated Weed Management (IWM) approach that will include 1) prevention, 2) identification, 3) a combination of control methods based on best information, and 4) evaluation to enable effective and adaptive management. This alternative will retain the current invasive plant prioritization and emphasis on park areas.

This approach varies from Alternative A in that Alternative B would include these components:

1. **Use of a comprehensive decision-making process** to guide park staff in prioritizing invasive species for management and considering all treatment options
2. **Strengthened prevention programs** through increased education and interpretation, increased enforcement of weed-free hay restrictions, better preventive practices in park operations such as the mitigation of weeds during construction and other ground disturbance activities, compliance of weed-free equipment and other vehicles entering the park, and strengthened detection surveys
3. **Establishment of monitoring protocols** to assess the effectiveness of prevention measures and treatments
4. **Use of approved biological control agents will be considered** as a treatment option after an appropriate review process is completed

Environmentally Preferable Alternative

According to the CEQ regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative "that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative."

Alternative B is the environmentally preferred alternative because it surpasses the current management practices in realizing national environmental policy goals, as stated in Section 101 of NEPA. Prevention and restoration efforts would be strengthened, reducing exposure to new infestations. More effective monitoring would provide information needed for adaptive management and improvement of treatments. The comprehensive decision-making process under this alternative would allow continuation of best practices by any resource manager rather than relying on the current expertise of park staff. Alternative B would provide the widest range of management options in controlling invasive plants in the park.

By contrast, Alternative A (No Action) is not the environmentally preferable alternative because the park would continue current vegetation management programs and practices to control invasive plant species in the park. Invasive vegetation management practices would not be expanded and monitoring of invasive plant control would not occur.

Why the Preferred Alternative Will Not Have a Significant Effect on the Human Environment

As defined in 40 CFR §1508.27, significance is determined by examining the following criteria:

Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

- ***The preferred alternative will not have a significant effect on the human environment.***

Implementation of the preferred (selected) alternative will result in some adverse impacts. However, this alternative has a wide range of beneficial and adverse effects (see "Mitigations Measures"). These effects are primarily short- and long-term, negligible to minor adverse impacts, with some potential (mostly localized) moderate beneficial effects on vegetation and rare plants from the preferred alternative. There are some short- and long-term, minor to moderate adverse impacts to human health and safety from the selected action. Although implementation of the preferred alternative will result in some adverse impacts, the overall benefit of the project outweighs these negative impacts.

- ***The degree to which the proposed action affects public health or safety.***

The preferred alternative will not adversely affect public health or safety. Impacts on human health and safety will primarily be minor to moderate due to mitigation measures that would allow for more systematic and documented implementation of invasive plant management treatments and based on use of required and identified safety measures.

- ***Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.***

The preferred (selected) alternative will not impact the unique characteristics of the area, including geothermal areas, wetlands, wild and scenic rivers or ecologically critical areas. Within Yellowstone

National Park, the Snake and Lewis rivers are designated as Wild and Scenic under the National Wild and Scenic Rivers Act. However, the preferred alternative would not affect this designation.

There would be localized short-term negligible to minor adverse effects from disturbance of soil to remove plants and from accessing treatment areas in geothermal areas and wetlands, as well as from manual/mechanical treatments, use of herbicides, cultural treatments (including fire) or biological control. Overall, there will be fewer adverse effects because there would be more systematic analysis of potential effects to identify treatment options.

• The degree to which the effects on the quality of the human environment are likely to be highly controversial.

There were no or little controversial impacts or aspects of the preferred alternative that surfaced during the environmental analysis process. Although some controversy was anticipated due to the subject of the EA and the likely ongoing use of herbicides and biological control, no controversy ensued during the public scoping or review processes. It is possible that this can be attributed to the recent emphasis by counties throughout the United States on implementing laws related to treating noxious weeds and/or to the ongoing use of an Integrated Pest Management approach to selecting treatments with the least possible effects. The issue of the use of biological control and the criteria used to determine the application of biocontrol is addressed in the "Response to Comments" below.

• The degree to which the possible effects on the quality on the human environment are highly uncertain or involve unique or unknown risks.

The effects on the human environment as addressed in the EA are known. The environmental process has not identified any effects that may involve highly unique or unknown risks. Mitigation measure stated in the EA will reduce the effects to the natural and human environment.

• The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

The preferred alternative (selected action) will implement an Integrated Weed Management (IWM) approach to invasive vegetation management. Managers will take action when such species interfere with natural processes and native species. The IWM approach as stated in the selected action will be used to determine when to control invasive plants and whether to use a selected treatment that will be effective as well as least detrimental to the human and natural environment. These activities, associated with mitigation measures stated in the EA, will not result in significant adverse affects on the human and natural environment; overall environmental effects will be beneficial. The preferred (selected) alternative neither establishes an NPS precedent for future actions with significant effects, nor represents a decision in principle about a future consideration.

• Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

Cumulative effects were analyzed in the environmental assessment and no significant cumulative impacts were identified. No significant cumulative effects and no highly uncertain, unique or unknown risks were identified during preparation of the EA or during the public review period.

• The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

The preferred (selected) alternative will have no adverse effect on historic properties or contributing features to historic properties. The Montana SHPO concurred with a finding of *"no adverse effect" on historic properties* on March 1, 2013. The Wyoming SHPO concurred with a determination of *"no adverse effect" on historic properties on* March 25, 2013.

- ***The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.***

The U.S. Fish and Wildlife Service on March 15, 2013, concurred with the NPS determination for listed species. The preferred alternative "may affect, but would be not likely to adversely affect" species listed or proposed for listing including grizzly bear, Canada lynx, and designated critical habitat for lynx. In addition, the NPS determined that the preferred alternative will not significantly overlap with occurrences of wolverine, which has been proposed for listing as a threatened species.

- ***Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.***

The preferred (selected) alternative will not violate any federal, state or local environmental protection laws.

The NPS has determined that the preferred alternative can be implemented with no significant adverse effects on soil and geothermal resources, wetlands and water resources, water quality, vegetation and rare plants, fish and wildlife, special status species, archeology and cultural landscapes, human health and safety, visitor use and experience, and park operations. The overall benefit of implementing the preferred alternative is that Yellowstone National Park will implement an Invasive Vegetation Management Plan using a decision-making process toward an Integrated Weed Management (IWM) approach to manage invasive terrestrial vegetation. The plan will coordinate pest biology, the environment, and available technology to use environmentally sound, cost-effective strategies that pose the least possible risk to people, park resources and the environment, and will emphasize cooperative efforts throughout the GYA.

Public Involvement and Native American Consultation

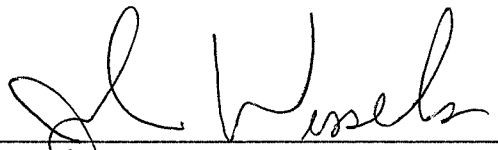
The EA was made available for public review and comment during a 30-day period ending March 22, 2013. To notify the public of this review period, a postcard or a press release was sent to stakeholders, interested parties, and newspapers, and a letter was mailed to 26 Native American tribes. Copies of the document were sent to certain agencies, interested parties, and posted on the NPS PEPC website at http://parkplanning.nps.gov/. Ten correspondences were received on the EA during this review period. Commenters included representatives from Park County, Wyoming, Weed and Pest Control District; Teton County, Wyoming, Weed and Pest Control District; the Wyoming Bio Control Steering Committee; and the North American Invasive Species Management Association. No comments were received from Native American tribes. Six commenters expressed support for preferred alternative and implementation of a park Integrated Weed Management Plan. Substantive comments centered on two primary topics: an interest in increased collaboration and the use of biocontrol agents as part of an Integrated Weed Management (IWM) program. Four commenters expressed support for expanded collaboration with state, county and other partners in invasive vegetation management in the Greater Yellowstone Area. Four commenters expressed support for the use of biological control in the park as part of the Integrated Weed Management program and additionally expressed concern regarding the EA's approach toward biological control in Appendix 8. These comments are addressed in the Errata Sheets and Response to Comments attached to this FONSI. The FONSI and Errata Sheets will be sent to all commenters.

Conclusion

As described above, the preferred (selected) alternative does not constitute an action meeting the criteria that normally require preparation of an environmental impact statement (EIS). The preferred alternative will not have a significant effect on the human environment. Environmental impacts that could occur are limited in context and intensity, with generally adverse impacts that range from localized to widespread, short- to long-term, and negligible to moderate. There are no unmitigated adverse effects on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local environmental protection law.

Based on the foregoing, NPS has determined that an EIS is not required for this management plan and thus will not be prepared.

Approved:



6/19/13

John Wessels
Regional Director, Intermountain Region, National Park Service

Date

Errata Sheets
Invasive Vegetation Management Plan
Yellowstone National Park

According to NPS policy, substantive comments are those that 1) question the accuracy of the information in the EA, 2) question the adequacy of the environmental analysis, 3) present reasonable alternatives that were not presented in the EA, or 4) cause changes or revisions in the proposal.

Some substantive comments may result in changes to the text of the EA, in which case, they are addressed in the "Text Changes" section of the Errata Sheets. Other substantive comments may require a more thorough explanatory response and are addressed in the "Response to Comments" section. NPS responds to all substantive comments in either or both of these sections.

The majority of substantive comments for this EA centered on two topics: an interest in increased collaboration and the use of biocontrol agents as part of an Integrated Weed Management (IWM) program. These concerns resulted in minor changes to the text of the EA and are also explained more thoroughly in the "Response to Comments" section.

Text Changes

Page 17, Table 2 – Change Imazameth to **Imazapic**.

Page 23 – Change Statement: "the list of priority groups would be updated periodically updated using the current list of nonnative species provided by the park botanist" add: **"and from surrounding state and county noxious weed lists."**

Page 24 – Change Statement "All herbicides and biological control agents would be approve by IPM specialists from Yellowstone and other NPS staff" add: **"and would consider consultations with university, state or county IPM specialists."**

Page 26 – Change Statement "Biocontrol agents may not be capable of completely eradicating an invasive plant population..." to **"Eradication of an invasive plant population should not be expected with biocontrol agents because as the number of plants decline, it is likely the population of biocontrol agents also declines."**

Page 26 – Change Statement "Biocontrol is **considered a cost-effective approach,** best suited to large, dense, nonnative plant infestations where eradication is impractical, Add: **or in areas of extremely rugged terrain where other control treatments are impractical or unsafe."**

Page 27 – Change Statement "Additional NEPA compliance **will be conducted beyond this Environmental Assessment** for use of biological controls if impacts would be determine to be **greater than** minor and adverse."

Pages 28 – Edit Programmatic Agreement (PA) so it reads **"2008 Servicewide Programmatic Agreement (PA)."**

Page 49 and 50 – Change "1995 Servicewide Programmatic Agreement (PA)" to **"2008 Servicewide Programmatic Agreement (PA)"** on both pages.

Page 125, Appendix 2 – add to **Watch List:** "Invasive plant species not documented or established in park, **considered an Emergency List, where rapid response and eradication will be implemented.**

Page 144, Appendix 7 – Change statement: "use of herbicides **as a last resort** in pest management" will be removed in the Appendix 7 of EA and replaced "with herbicides **as part of the park's IWM program** in pest management."

Response to Comments

Comment 1 – Add the language in bold to this sentence "Outside sand and gravel pits that provide material for park use would be required to have a weed control plan approved by the respective county to pass an annual inspection to meet **North American Invasive Species Management Association (NAISMA) Weed Free Gravel Standards."**

Response 1 – This sentence in the preferred (selected) alternative will be modified to indicate sand and gravel pit inspections must meet **North American Invasive Species Management Association (NAISMA) Weed Free Gravel Standards**. As stated in the preferred alternative, NPS staff will also annually inspect pits that are sources for material used in the park for nonnative plant species that are a high priority to park prevention programs.

Comment 2 – Include the impacts of herbicides on wilderness values in the EA.

Response 2 – In 1972, 2,023,721 acres of Yellowstone National Park was recommended for designation as wilderness under the National Wilderness Preservation System. The NPS manages Yellowstone's recommended wilderness to preserve their wilderness resources and values in expectation of eventual wilderness designation (NPS 2006). The Invasive Vegetation Management Plan states that weed control will involve both front- and backcountry areas with localized manual and individual "spot spraying" chemical control treatments. Additionally, the EA states that no mechanized or motorized equipment or access will be anticipated in recommended wilderness, and will not be considered without undertaking a Minimum Requirement Analysis and approval. Survey and treatments of invasive vegetation will accomplish the stated goals of invasive vegetation management stated in the EA to sustain native plant communities. The proposed action in the preferred alternative (selected action) will use localized herbicide applications which may affect wilderness values. However, localized weed treatments will maintain native vegetation communities and sustain wilderness values within the park's recommended wilderness. With the mitigations stated in the EA, it was determined under "Impact Topics Dismissed and Retained for Further Analysis" that invasive plant treatments will have minor or less impacts on wilderness values. Wilderness was therefore dismissed as an impact topic.

Comment 3 – Commenters requested that the park increase partnerships and collaboration with neighboring agencies and inform neighbors of new invasive species detected.

Response 3 – In the preferred (selected) alternative, the park will work collaboratively with partners regarding invasive plant treatment activities. For example, a cooperative weed control effort is currently scheduled for summer 2013 with the GYCC (Greater Yellowstone Coordinating Committee) Terrestrial Invasive Species Subcommittee. The park will inform neighbor federal, state, and county agencies if a new invasive weed species is detected. This action will be added to the preferred alternative under Collaboration.

Comment 4 – Commenters requested that the park consider Early Detection, Rapid Response (EDRR) and the invasive species early detection mapping and reporting system to report newly reported species. Information about newly reported species can then be shared with neighboring cooperative weed management agencies.

Response 4 – The NPS will use an EDRR response system for identifying and controlling new invader plant species when they are discovered, knowing that an immediate initial response is critical to controlling new invasive species. The NPS is working with collaborators within the GYCC Terrestrial Invasive Species Subcommittee to include Yellowstone National Park in the early detection mapping and reporting system. In the event a new invasive plant species is discovered, the NPS will share this information with neighboring cooperative weed management agencies.

Comment 5 – In Appendix 7, there is a statement, "(S)urfactants are addressed specifically later in the Appendix, and discussed specifically in terms of being applicable to multiple brand formulations." However, there is no further discussion about surfactants in this appendix.

Response 5 – Surfactants were not discussed further. Specific information sheets on commonly used surfactants will be added to Appendix 7 of the EA. Surfactants discussed include: Brewer 90-10, Freeway and Spreader 90, LI 700 Cornbelt Methylated Soy-Stik and MSO.

Comment 6 – Preferred Alternative, Biological Control – Commenters expressed concern that biocontrol would be used only after other methods fail. The first criteria bullet in the preferred alternative should be removed.

Response 6 – National Park Service Management Policies (NPS 2006) address the need to control exotic species. It also states that "in general, exotic species will not be introduced in parks. In rare situations, an exotic species may be introduced or maintained to meet specific, identified management needs when all feasible and prudent measures to minimize the risk of harm have been taken." In recognition of NPS policies, biological control will remain as a consideration toward an IWM approach in invasive vegetation management, and the first biocontrol criteria bullet in the preferred alternative will remain in the EA.

Comment 7 – Preferred Alternative, Biological Control – Commenters suggested that biocontrols should be evaluated using a cost-benefit approach.

Response 7 – While the NPS recognizes that biological controls can be a cost-effective treatment for invasive plant populations, as stated in the preferred alternative, park staff will consider the environmental impacts on park resources and the required and appropriate environmental compliance (NEPA) in order to evaluate whether the use of a biocontrol is an appropriate treatment consideration in invasive vegetation management. Costs will be recognized after environmental impacts are assessed.

Comment 8 – Preferred Alternative, Biological Control – A commenter suggested that APHIS adequately researches the effects of biocontrols on native insect populations.

Response 8 – The NPS contacted the Animal Plant and Health Inspection Service (APHIS) Biocontrol Division as part of this review. APHIS advised the NPS that the agency has never required pre-release testing for the impacts of biocontrol insects on native insects because these types of impacts would almost always be indirect effects that would be hard or impossible to test or predict. These indirect effects would only arise several years after field release. Furthermore, it wasn't until the last 10 or so years that each proposed biocontrol release was evaluated by APHIS using the more thorough comprehensive environmental review process under NEPA. The NEPA process requires consideration of potential indirect as well as short- and long-term effects using the best available data. (Sue Salmons, NPS Northern Rocky Mountain Exotic Plant Management Team, pers. comm.)

In light of this information and NPS resource protection polices, park managers will consider release of biocontrols that have been field tested long enough and thoroughly enough to be able to determine they have no adverse effects on native communities. Any proposed park use of a biocontrol will be fully evaluated and meet the criteria outlined in the preferred (selected) alternative, including analysis for adequate NEPA compliance.

Comment 9 – Appendix 8 Potential Use of Biological Control in Yellowstone National Park Invasive Vegetation Management – This review of biocontrol agents did not use the criteria to evaluate the three biological control examples in Appendix 8.

Response 9 – Appendix 8 Potential Use of Biological Control in Yellowstone National Park Invasive Vegetation Management was written to establish a framework to evaluate biological control as a

consideration for invasive plant management. Examples were used to investigate specifically into the scientific literature as to their uses and potential risks. The example biocontrols were not presented in the EA as potential agents for use in the park. Rather, they helped elucidate NPS concerns regarding biocontrol and aided in the development of the criteria for use of biocontrol in the park. When a biocontrol agent is considered for use as part of the park's IWM approach, it will then be fully evaluated using the criteria stated in the preferred (selected) alternative, and the environmental effects on park resources will be evaluated under the required environmental NEPA review process.

Comment 10 – Appendix 8 Potential Use of Biological Control in Yellowstone National Park Invasive Vegetation Management – This review of biocontrol is biased against use of biocontrol agents. The review of literature was incomplete.

Response 10 – The Yellowstone National Park Invasive Vegetation Management Plan and EA will implement an Integrated Weed Management (IWM) approach to manage invasive vegetation in the park. The plan allows for a full set of preventive survey and treatment options that will be employed to control invasive plants. Biological control has been the most controversial topic under the IWM approach to invasive vegetation management. The topic was discussed extensively during internal and external scoping and during the public review of the EA. While the NPS recognizes the need to consider all management options to control invasive vegetation, park management also acknowledges the potential direct and indirect risks associated with introducing a nonnative organism to the park to control invasive plants. The risk of unknown effects exists when introducing some biological control agents. The literature discussed in Appendix 8 recognizes that some unforeseen effects have occurred where biocontrols were used. Commenters to the EA, and specifically Appendix 8, brought forward additional recent literature demonstrating, in general, the beneficial effects of biocontrol. The NPS recognizes that additional literature can be helpful to developing a more balanced approach toward the potential use of biological control agents. This perspective and additional literature has been included in an edited version of Appendix 8 of the EA. However, NPS policy states that "exotic species may be introduced or maintained to meet specific, identified management needs when all feasible and prudent measures to minimize the risk of harm have been taken" (NPS 2006). Moreover, recently developed NPS policy (NPS 2012) recognizes the risks and difficulty of taking management action in changing environments. This policy recommends that park managers apply a "Precautionary Principle" as an operating guide, recognizing that NPS managers cannot fully understand complex and continuously changing ecological and cultural systems. The use of biological control will remain a consideration as part of the IWM approach to park invasive plant management. The criteria set forth in the preferred (selected) alternative will guide park managers on whether to employ biocontrol strategies and will address biocontrol actions conservatively so as not to irreversibly impact park resources. The NPS will use the best science-informed decisions toward the most complete and effective invasive vegetation management.

(NPS 2006). National Park Service, U.S. Department of the Interior. 2006. Management Policies 2006. Washington, D.C. http: //www.nps.gov/policy/MP2006.pdf

(NPS 2012). National Park Service System Advisory Board Science Committee. 2012. Revisiting Leopold: Resource Stewardships in the National Parks. Washington, D.C. www.nps.gov/calltoaction/PDF/LeopoldReport_2012.pdf

Appendix – Non-Impairment Finding

The National Park Service's *Management Policies, 2006* require analysis of potential effects to determine whether or not actions will impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values.

However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

An impact would be less likely to constitute impairment if it is an unavoidable result of an action necessary to pursue or restore the integrity of park resources or values and it cannot be further mitigated.

The park resources and values that are subject to the no-impairment standard generally include:

- the park's scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;
- appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;
- the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and
- any additional attributes encompassed by the specific values and purposes for which the park was established.

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. The NPS's

threshold for considering whether there could be impairment is based on whether an action will have significant effects.

Impairment findings are not necessary for visitor use and experience, socioeconomics, public health and safety, environmental justice, land use, and park operations, because impairment findings relates back to park resources and values, and these impact areas are not generally considered park resources or values according to the Organic Act, and cannot be impaired in the same way that an action can impair park resources and values. After dismissing the above topics, topics remaining to be evaluated for impairment include soil resources; geothermal resources; wetland and water resources; water quality; vegetation; fish and wildlife species; threatened, endangered, and special status species; archeological resources; and cultural landscapes. These topics are detailed below.

- **Soil Resources -** Implementation of the preferred alternative (selected action) and an Integrated Weed Management program in Yellowstone National Park would affect the park's soils through short-term and negligible to minor adverse impacts. Vegetation restoration activities connected with park construction activities would be expanded and have long-term, beneficial and minor effects on soils. Because the preferred alternative (selected action) would be expected to have direct, short- and long-term, negligible to minor adverse and beneficial impacts on soil resources, there will be no impairment to soil resources.

- **Geothermal Resources -** The preferred alternative (selected action) would have direct, short- and long-term, minor adverse impacts on the park's geothermal resources. Vegetation restoration activities connected with park construction activities would have short-term, minor adverse effects on geothermal resources. Because the preferred alternative (selected action) would be expected to have direct, short- and long-term, minor adverse impacts on the park's geothermal resources, there will be no impairment to geothermal resources.

- **Wetland and Water Resources -** Implementation of the preferred alternative (selected action) and an Integrated Weed Management program in Yellowstone National Park have direct, short -term, minor adverse impacts on the park's wetlands and water resources. The impact of vegetation restoration connected with construction activities occurring in wetlands would have short-term, adverse and minor to wetlands. Because the preferred alternative (selected action) would be expected to have direct, short-term, minor adverse impacts on wetland and water resources, there will be no impairment to these resources.

- **Water Quality -** The preferred alternative (selected action) would have direct, short-term, minor adverse impacts on the park's water quality. Vegetation restoration activities connected with park construction activities would have short-term, minor adverse impacts on water quality. Because the preferred alternative (selected action) would be expected to have direct, short-term, minor adverse impacts to water quality, there will be no impairment to water quality.

- **Vegetation including Rare Plants -** Implementation of the preferred alternative (selected action) and an Integrated Weed Management program in Yellowstone National Park would have direct, short-term, negligible to minor adverse impacts and long-term, minor beneficial effects on the park's vegetation, including rare plants. Vegetation restoration activities connected with park construction activities would be expanded and have long-term, beneficial and minor effects on native vegetation. Biological control of invasive vegetation species would be employed after appropriate review and analysis would be completed and would have long-term, minor beneficial effects on native plant communities. Because the preferred alternative (selected action) would be expected to have direct, short- and long-term, negligible to minor adverse impacts and short- and long-term, minor to moderate beneficial effects on native

vegetation and rare plant species, there will be no impairment to vegetation including rare plants.

- **Fish and Wildlife Species -** Implementation of the preferred alternative (selected action) and an Integrated Weed Management program in Yellowstone National Park would have direct, short-term, negligible to minor adverse impacts and long-term, minor beneficial effects on the park's fish and wildlife. Vegetation restoration activities connected with park construction activities would be expanded and have long-term, beneficial and minor effects on fish and wildlife habitat. Because the preferred alternative (selected action) would be expected to have direct, short- and long-term, negligible to minor adverse and minor beneficial impacts on fish and wildlife species and their habitats, there will be no impairment to these species.

- **Threatened, Endangered, and Special Status Species -** Under the preferred alternative (selected action), overall Integrated Weed Management (IWM) would have short and long term, direct and indirect beneficial effects on native vegetation and threatened wildlife species forage and critical habitat due to utilizing an adaptive approach designed to preserve the biological diversity of native flora through prevention, containment, and control of invasive plants. Overall management of invasive, nonnative vegetation would create more threatened wildlife foraging opportunities,

  Educational, preventive and collaborative efforts of the IWM approach are anticipated to have short and long term, indirect beneficial impacts to threatened wildlife use of native forage due to the increase in preventive measures which would reduce the need for invasive plant treatments. Potential impacts from specific activities under the IWM approach are described below.

  Mitigation measures would include removal of invasive vegetation considered to be high value forage to grizzly bears or that would potentially affect Canada lynx critical habitat would occur with consultation with the parks Threatened and Endangered Species Biologists. Existing NPS efforts do not overlap with previously documented wolverine occurrences, movements, or habitat, and so are not discussed further in this alternative given their proposed status. Access for invasive vegetation treatments would not occur in park designated Bear Management Areas unless under consultation with the park's Bear Management Biologist. Monitoring of nonnative plant control treatments would enable park staff to adjust treatment types to maximize control efforts with minimum impacts on native plant species. Restoration activities would use top soil conservation, be localized, create short-term disturbance, and provide long-term native vegetation growth.

  Overall, survey and treatment activities under the preferred alternative (selected action) would be expected to have short-term, negligible to minor adverse and minor long-term beneficial effects on threatened and candidate wildlife species and critical habitat. Effects for listed species and critical habitat include:

  - **Grizzly bears** are observed throughout the park and forage on native and nonnative vegetation. Some nonnative plant species that are considered wildlife forage would be treated. For example, red clover (*Trifolium repens*), which is considered high quality forage for grizzly bears, would be treated in front country areas at the request of NPS bear management to remove it as a bear attractant. Invasive vegetation control activities would not occur in Bear Management Areas unless under consultation with the park's Bear Management Biologist. Actions proposed under this alternative "may affect but would not likely to adversely affect" listed grizzly bears.

- **Canada lynx** are considered rare in Yellowstone National Park. Some invasive plant treatment would occur in lynx habitat. However, the small scale of this activity would have a negligible impact on lynx. Actions proposed under this alternative "may affect but would not likely to adversely affect" listed Canada lynx.

- **Canada lynx critical habitat** has been designated in Yellowstone National Park. Invasive plant treatment would occur in specific areas in this habitat. The presence of nonnative plants would indirectly affect the food and cover available to snowshoe hares, a primary lynx food source, if they became components of the forest understory in the designated habitat (J. Whipple, pers. comm). No extensive changes in forest vegetation would be anticipated as a result of invasive plant treatments. Actions proposed under this alternative "may affect but would not likely to adversely affect" listed Canada lynx critical habitat.

Because of the limited degree of disturbance associated with invasive vegetation management and native vegetation restoration under this alternative, there would be direct, short-term, negligible to minor adverse effects and long-term, negligible beneficial effects on threatened, candidate, and special status wildlife species and its critical habitat.

Implementation of the preferred alternative (selected action) and an Integrated Weed Management program in Yellowstone National Park would have direct, short-term, negligible to minor adverse impacts and long-term, negligible beneficial effects on the park's threatened, proposed threatened, critical habitat, and special status species. Vegetation restoration activities connected with park construction activities would be expanded and have long-term, beneficial and negligible effects on them. In conclusion, when combined with past, present, and foreseeable future actions, the preferred alternative (selected action) would be expected to have direct, short-term, negligible to minor adverse and long-term, negligible to minor beneficial impacts on threatened and special status wildlife species. Because the preferred alternative (selected action) overall would be expected to have direct, short-term, negligible to minor adverse and indirect long-term, negligible to minor beneficial impacts on threatened and special status wildlife species, there will be no impairment to these species. Actions proposed under this alternative "may affect but are not likely to adversely affect" federally listed species or critical habitat.

- **Archeological Resources -** Implementation of the preferred alternative (selected action) and an Integrated Weed Management program in Yellowstone National Park would have direct, short-term, negligible to minor adverse impacts on the park's archeological resources. Because the preferred alternative (selected action) would be expected to have direct, short-term, negligible to minor adverse impacts on archeological resources, there will be no impairment to these resources. For purposes of Section 106, the determination would be no adverse effect on archeological resources.

- **Cultural Landscapes -** Implementation of the preferred alternative (selected action) and an Integrated Weed Management program in Yellowstone National Park would have direct, short-term, minor adverse impacts and long-term, minor beneficial effects on vegetation within and adjacent to cultural landscapes. Vegetation restoration activities connected with park construction activities would be expanded and have long-term. minor beneficial impacts on cultural landscapes. Because the preferred alternative (selected action) would be expected to have direct, short- and long-term, minor adverse impacts and short- and long-term, minor beneficial effects on cultural landscapes in the park, there will be no impairment to cultural

landscapes. For purposes of Section 106, the determination would be no adverse effect to cultural landscapes under this alternative.

In conclusion, as guided by this analysis, good science and scholarship, advice from subject matter experts and others who have relevant knowledge and experience, and the results of public involvement activities, it is the Superintendent's professional judgment that there will be no impairment of park resources and values from implementation of the selected alternative.